

## WHAT IS CLAIMED IS:

1. A master for printing servo patterns, comprising:
  - a substrate;
  - a layer of a first material disposed over at least a portion of a surface of the substrate, the first material having a magnetic permeability of at least about five; and
  - a pattern of a second material disposed over at least a portion of a surface of the layer of first material, the second material having a magnetic permeability of at least about five.
2. The master of claim 1, wherein the first material has a magnetic permeability of at least about 50.
3. The master of claim 1, wherein the first material has a magnetic permeability of at least about 100.
4. The master of claim 1, wherein the first material comprises a material selected from the group consisting of nickel, cobalt, iron, nickel alloys, cobalt alloys and iron alloys.
5. The master of claim 1, wherein the second material has a magnetic permeability of at least about 10.
6. The master of claim 1, wherein the second material has a magnetic permeability of at least about 50.
7. The master of claim 1, wherein the second material comprises a material selected from the group consisting of nickel, cobalt, iron, nickel alloys, cobalt alloys and iron alloys.
8. The master of claim 1, wherein the pattern of the second material is a pattern of teeth.
9. The master of claim 8, wherein the teeth have a dimension of at least about 0.1 micron in a direction perpendicular to the surface of the layer of the first material.

10. The master of claim 9, wherein the teeth have a dimension at least about 0.1 micron in a direction parallel to the surface of the layer of the first material.
11. The master of claim 8, wherein the teeth have a dimension at least about 0.1 micron in a direction parallel to the surface of the layer of the first material.
12. The master of claim 1, wherein the layer of the first material has a dimension of at least about 0.1 micron in a direction perpendicular to the surface of layer of the first material.
13. The master of claim 1, wherein the layer of the first material has a dimension of at least about 0.25 micron in a direction perpendicular to the surface of layer of the first material.
14. The master of claim 1, wherein the layer of the first material has a dimension of from about 0.4 micron to about 0.6 micron in a direction perpendicular to the surface of layer of the first material.
15. The master of claim 1, wherein the layer of the first material is disposed over the entire surface of the substrate.
16. The master of claim 1, wherein the first and second materials are the same material.
17. The master of claim 16, wherein the first material comprises a material selected from the group consisting of nickel, cobalt, iron, nickel alloys, cobalt alloys and iron alloys.
18. The master of claim 1, wherein the pattern of the second material is formed by etching portions of the layer of the first material.
19. The master of claim 1, further comprising a layer of a third material disposed over a surface of the pattern of the second material.

20. The master of claim 19, wherein the third material has a magnetic permeability of less than about five.
21. The master of claim 19, wherein the third material has a magnetic permeability of less than about 1.1.
22. The master of claim 19, wherein the third material comprises a material selected from the group consisting of carbon, chrome, silicon and an oxide of the second material.
23. The master of claim 19, wherein the layer of the third material has a dimension of at least about 50Å in a direction perpendicular to the surface of the layer of the first material.
24. The master of claim 1, further comprising a layer of a third material disposed between the substrate and the layer of the first material.
25. The master of claim 24, wherein the third material comprises a material selected from the group consisting of chrome and silicon.
26. A master for printing a servo pattern, comprising:  
a substrate;  
a layer of a first material disposed over at least a portion of a surface of the substrate, the layer of the first material having a dimension of at least about 0.1 micron in a direction perpendicular to the surface of the substrate; and  
a pattern of a second material disposed over at least a portion of a surface of the layer of first material, the second material having a magnetic permeability of at least about five.
27. The master of claim 26, wherein the dimension of the layer of the first material in the direction perpendicular to the surface of the substrate is at least about 0.25 micron.
28. The master of claim 26, wherein the dimension of the layer of the first material in the direction perpendicular to the surface of the substrate is from about 0.4 micron to about 0.6 micron.

29. The master of claim 26, wherein the first material has a magnetic permeability of at least about five.
30. The master of claim 26, wherein the first material comprises a material selected from the group consisting of nickel, cobalt, iron, nickel alloys, cobalt alloys and iron alloys.
31. The master of claim 26, wherein the second material has a magnetic permeability of at least about 10.
32. The master of claim 26, wherein the second material has a magnetic permeability of at least about 50.
33. The master of claim 26, wherein the second material comprises a material selected from the group consisting of nickel, cobalt, iron, nickel alloys, cobalt alloys and iron alloys.
34. The master of claim 26, wherein the pattern of the second material is a pattern of teeth.
35. The master of claim 34, wherein the teeth have a dimension of at least about 0.1 micron in a direction perpendicular to the surface of the layer of the first material.
36. The master of claim 35, wherein the teeth have a dimension at least about 0.1 micron in a direction parallel to the surface of the layer of the first material.
37. The master of claim 34, wherein the teeth have a dimension at least about 0.1 micron in a direction parallel to the surface of the layer of the first material.
38. The master of claim 26, wherein the layer of the first material is disposed over the entire surface of the substrate.
39. The master of claim 26, wherein the first and second materials are the same material.

40. The master of claim 39, wherein the first material comprises a material selected from the group consisting of nickel, cobalt, iron, nickel alloys, cobalt alloys and iron alloys.
41. The master of claim 26, wherein the pattern of the second material is formed by etching portions of the layer of the first material.
42. The master of claim 26, further comprising a layer of a third material disposed over a surface of the pattern of the second material.
43. The master of claim 42, wherein the third material has a magnetic permeability of less than about five.
44. The master of claim 42, wherein the third material has a magnetic permeability of less than about 1.1.
45. The master of claim 42, wherein the third material comprises a material selected from the group consisting of carbon, chrome, silicon and an oxide of the second material.
46. The master of claim 42, wherein the layer of the third material has a dimension of at least about 50Å in a direction perpendicular to the surface of the substrate.
47. The master of claim 26, further comprising a layer of a third material disposed between the substrate and the layer of the first material.
48. The master of claim 47, wherein the third material comprises a material selected from the group consisting of chrome and silicon.
49. A master for printing a servo pattern, comprising:  
a substrate;  
a pattern of a first material disposed over at least a portion of a surface of the substrate, the first material having a magnetic permeability of at least about five; and

a layer of a second material disposed over at least a portion of the pattern of the first material.

50. The master of claim 49, wherein the second material has a magnetic permeability of less than about five.

51. The master of claim 49, wherein the second material has a magnetic permeability of less than about four.

52. The master of claim 49, wherein the second material has a magnetic permeability of less than about 1.1.

53. The master of claim 49, wherein the second material comprises a material selected from the group consisting of carbon, chrome, silicon and an oxide of the second material.

54. The master of claim 47, wherein the second material comprises carbon.

55. The master of claim 49, wherein the layer of the second material has a dimension of at least about 50Å in a direction perpendicular to the surface of the substrate.

56. The master of claim 49, wherein the layer of the second material has a dimension of at least about 100Å in a direction perpendicular to the surface of the substrate.

57. The master of claim 49, wherein the layer of the second material has a dimension of at least about 250Å in a direction perpendicular to the surface of the substrate.

58. The master of claim 49, further comprising a layer of a third material disposed between the pattern of the first material and the substrate.

59. The master of claim 58, wherein the third material comprises a material selected from the group consisting of chrome and silicon.

60. The master of claim 58, wherein the third material has a dimension of from about 10Å to about 500Å in a direction perpendicular to the surface of the substrate.
61. The master of claim 49, further comprising a layer of a third material disposed between the substrate and the pattern of the first material, the third material having a magnetic permeation of at least about five.
62. The master of claim 61, wherein the third material comprises a material selected from the group consisting of nickel, cobalt, iron, nickel alloys, cobalt alloys and iron alloys.
63. The master of claim 49, wherein the pattern of the first material is a pattern of teeth.
64. A system, comprising:  
a master for printing a servo pattern, comprising:  
a substrate;  
a layer of a first material disposed over at least a portion of a surface of the substrate, the first material having a magnetic permeability of at least about five; and  
a pattern of a second material disposed over at least a portion of a surface of the layer of first material, the second material having a magnetic permeability of at least about five; and  
a recording medium configured so that the system can be used to form a magnetic pattern in the recording medium via a magnetic printing process.
65. The system of claim 64, wherein the recording medium comprises a disk.
66. The system of claim 64, wherein the recording medium comprises a tape.
67. The system of claim 64, wherein the recording medium comprises a credit card.
68. A system, comprising:  
a master for printing a servo pattern, comprising:  
a substrate;

a layer of a first material disposed over at least a portion of a surface of the substrate, the layer of the first material having a dimension of at least about 0.1 micron in a direction perpendicular to the surface of the substrate, the second material having a magnetic permeability of at least about five; and

a pattern of a second material disposed over at least a portion of a surface of the layer of first material; and

a recording medium configured so that the system can be used to form a magnetic pattern in the recording medium via a magnetic printing process.

69. The system of claim 68, wherein the recording medium comprises a disk.

70. The system of claim 68, wherein the recording medium comprises a tape.

71. The system of claim 68, wherein the recording medium comprises a credit card.

72. A system, comprising:

a master for printing a servo pattern, comprising:

a substrate;

a pattern of a first material disposed over at least a portion of a surface of the substrate, the first material having a magnetic permeability of at least about five; and

a layer of a second material disposed over at least a portion of the pattern of the first material; and

a recording medium configured so that the system can be used to form a magnetic pattern in the recording medium via a magnetic printing process.

73. The system of claim 72, wherein the recording medium comprises a disk.

74. The system of claim 72, wherein the recording medium comprises a tape.

75. The system of claim 72, wherein the recording medium comprises a credit card.

76. A method of servo printing, comprising:



contacting a recording medium with a master for printing a servo pattern, the master including a substrate, a layer of a first material disposed over at least a portion of a surface of the substrate, the first material having a magnetic permeability of at least about five, and a pattern of a second material disposed over at least a portion of a surface of the layer of first material, the second material having a magnetic permeability of at least about five.

77. The method of claim 76, further comprising exposing the master to a magnetic field to form a magnetic pattern in the recording medium.

78. A method of servo printing, comprising:

contacting a recording medium with a master for printing a servo pattern, the master including a substrate, a layer of a first material disposed over at least a portion of a surface of the substrate, the layer of the first material having a dimension of at least about 0.1 micron in a direction perpendicular to the surface of the substrate, and a pattern of a second material disposed over at least a portion of a surface of the layer of first material, the second material having a magnetic permeability of at least about five.

79. The method of claim 78, further comprising exposing the master to a magnetic field to form a magnetic pattern in the recording medium.

80. A method of servo printing, comprising:

contacting a recording medium with a master printing a servo pattern, the master including a substrate, a pattern of a first material disposed over at least a portion of a surface of the substrate, the first material having a magnetic permeability of at least about five, and a layer of a second material disposed over at least a portion of the pattern of the first material.

81. The method of claim 80, further comprising exposing the master to a magnetic field to form a magnetic pattern in the recording medium.